Worksheet #2

Please turn this in at the end of class (don't worry, we're not grading on correctness!). Make sure to write your login legibly. Sit with a partner or to work on these together though the lecture (or make friends with the people around you!) Check your answers with other neighbors.

**Question 1:**
How many operations are performed in the argmax function if the list has:

a. 10 elements?  
  d. 40 elements?  

b. 20 elements?  
  e. 100 elements?  

c. 30 elements?  
  f. 100,000 elements?

Plot the first four of these results on the chart to the right. Ponder the bigger one.

**Question 2:**
How many operations are performed in the possible_products function if the list has:

a. 10 elements?  
  d. 40 elements?  

b. 20 elements?  
  e. 100 elements?  

c. 30 elements?  
  f. 100,000 elements?

Plot the first four of these results on the chart to the right. Ponder the bigger one.

**Question 3:**

a. Does $n = O(n^2)$?  

b. Does $n^2 = O(n^3)$?  

c. Why or why not?

**Question 4:**

<table>
<thead>
<tr>
<th>Function, f(n)</th>
<th>Big-$\Theta$</th>
<th>Another Big-$\Theta$</th>
<th>Big-$\Omega$</th>
<th>Big-$\Theta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$an + b$</td>
<td>$O(n)$</td>
<td>$O(n^{1+\epsilon})$</td>
<td>$\Omega(n)$</td>
<td></td>
</tr>
<tr>
<td>$an^2 + bn + c$</td>
<td>$O(n^2)$</td>
<td>$O(n^2)$</td>
<td>$\Omega(n)$</td>
<td></td>
</tr>
<tr>
<td>$a$</td>
<td>$O(n)$</td>
<td>$O(2^n)$</td>
<td>$\Omega(1)$</td>
<td></td>
</tr>
<tr>
<td>$3^n + an^{4\epsilon}$</td>
<td>$O(3^n)$</td>
<td>$O(50^n)$</td>
<td>$\Omega(n)$</td>
<td></td>
</tr>
<tr>
<td>$an + blog(n)$</td>
<td>$O(n^2)$</td>
<td>$O(n \log(n))$</td>
<td>$\Omega(\log(n))$</td>
<td></td>
</tr>
</tbody>
</table>

"ahah! / "oops" moments to share with the class: